



# Improving Environmental Quality in Child Care

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# Today's Talk

- Overview of environmental concerns in child care;
- Pesticide use and pest management in California child care facilities;
- Research highlights from environmental monitoring;
- Regional and national trends.





# Why is the quality of the environment in ECE so important?

- ~13,000,000 children in childcare nationally

In California:

- ~50,000 licensed facilities
- 146,000 staff





# Childcare and preschool environments may be better than where the child lives:

- Substandard housing is common, especially in low-income communities;
- Daycare/preschool environments may offer healthier environment to children;





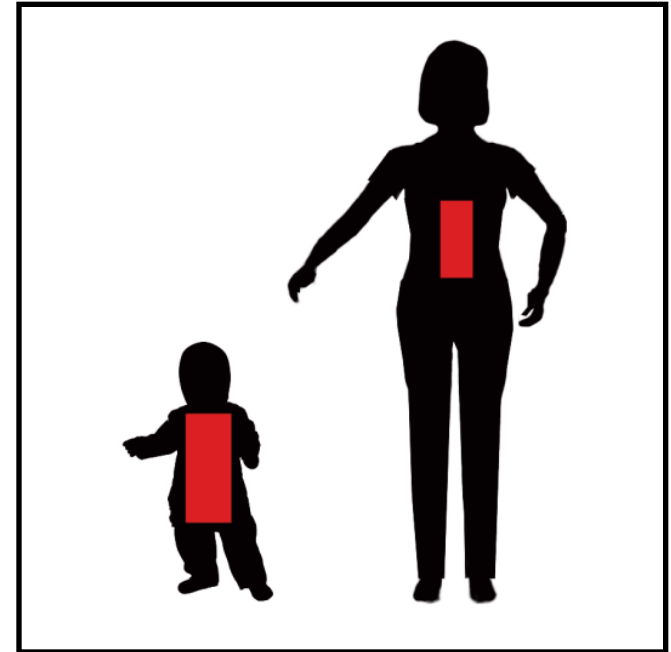
A photograph showing a white door frame set against a dark wood background. The entire surface of the door frame is covered with a dense layer of small, dark, speck-like cockroach feces. The text "Cockroach feces in home environment." is overlaid on the lower-left portion of the image.

**Cockroach feces in home environment.**



# Why Concerns About Children?

- Higher exposures:
  - Frequent contact with the ground or floor
  - Hand-to-mouth activity
  - Less varied diet
  - Eat, drink, and breathe more per kg
  - Spend most of their time indoors
- Physiologically immature
  - Metabolic pathways undeveloped
- Neural architecture not yet in place



Children are more  
vulnerable than adults.





# Specific Concerns

- [Asthma](#)
- [Chemical Hazards](#)
- [Environmental Tobacco Smoke](#)
- [Green Cleaning](#)
- [Indoor Air Quality](#)
- [Lead](#)
- [Mercury](#)
- [Mold](#)
- [Pesticides](#)
- [Plastics](#)
- Disinfectants





My Daughter's preschool had peeling lead  
paint adjacent to an eating area=**125,000 ppm**.  
The standard is **600 PPM**

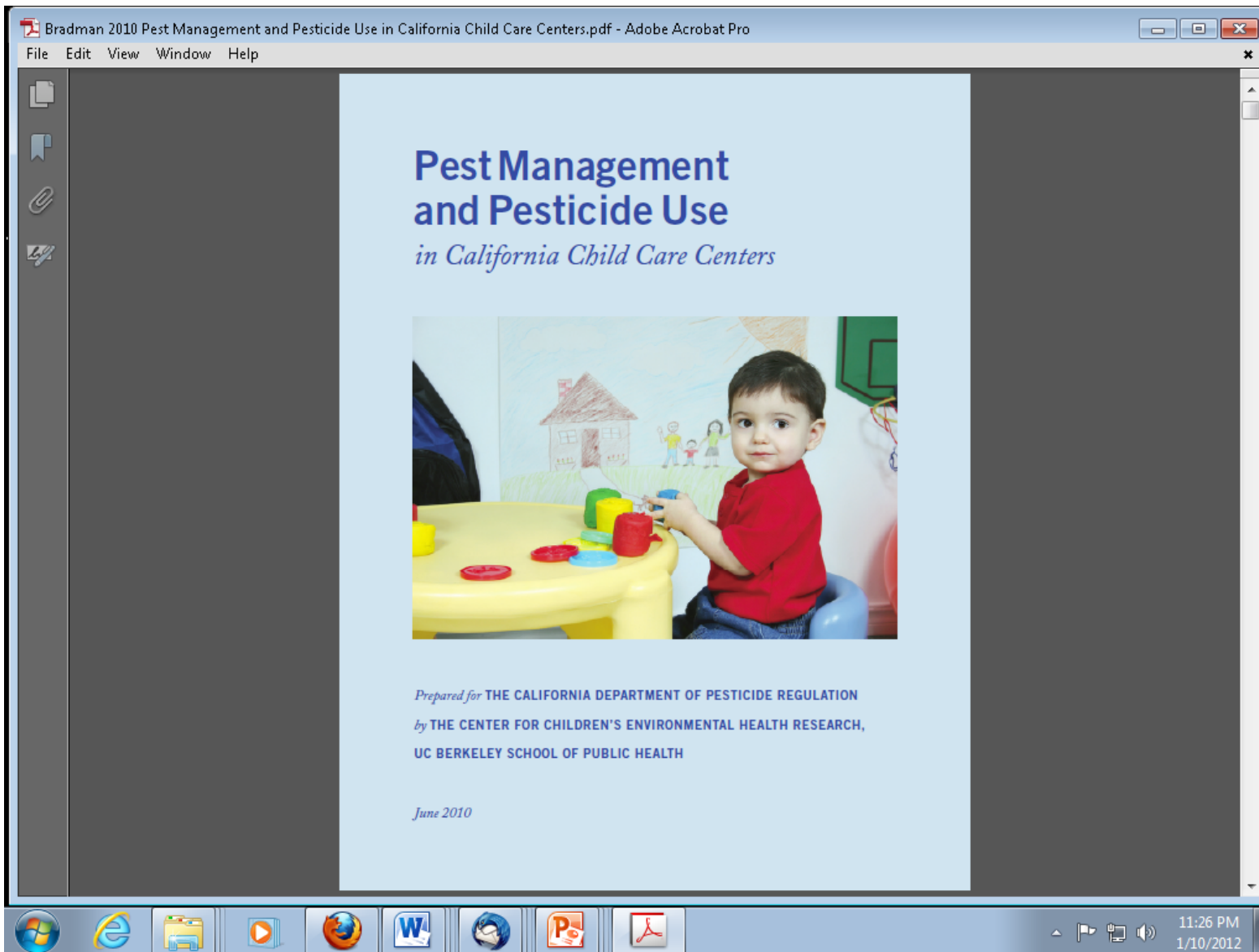


Nationwide=14%  
(EPA/HUD)





# Research Highlights

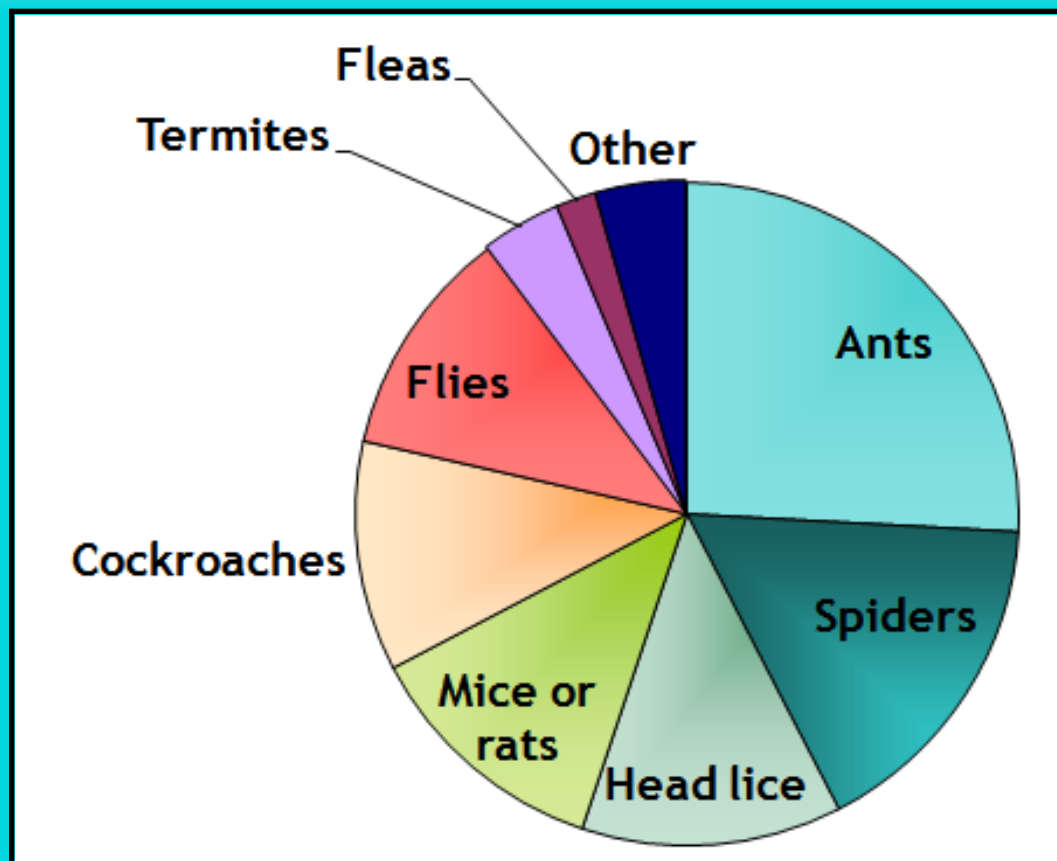




90% reported at least one pest problem.



# WHAT ARE THE MOST COMMON **INDOOR** PESTS IN CALIFORNIA CHILD CARE CENTERS?



Bradman, A. , Dobson, C., Leonard, V. & Messenger, B. (2010). *Pest Management and Pesticide Use in California Child Care Centers*, Center for Children's Environmental Health Research, School of Public Health, UC Berkeley at [apps.cdpr.ca.gov/schoolipm/childcare/pest\\_mgt\\_childcare.pdf](https://apps.cdpr.ca.gov/schoolipm/childcare/pest_mgt_childcare.pdf).







# Pesticide Use in California Child Care Centers

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Used any pesticide at least once:	55%
Used spray or fogger (non-exempt):	47%
Used exempt pesticide:	21%
Used at least 1 IPM method:	68%

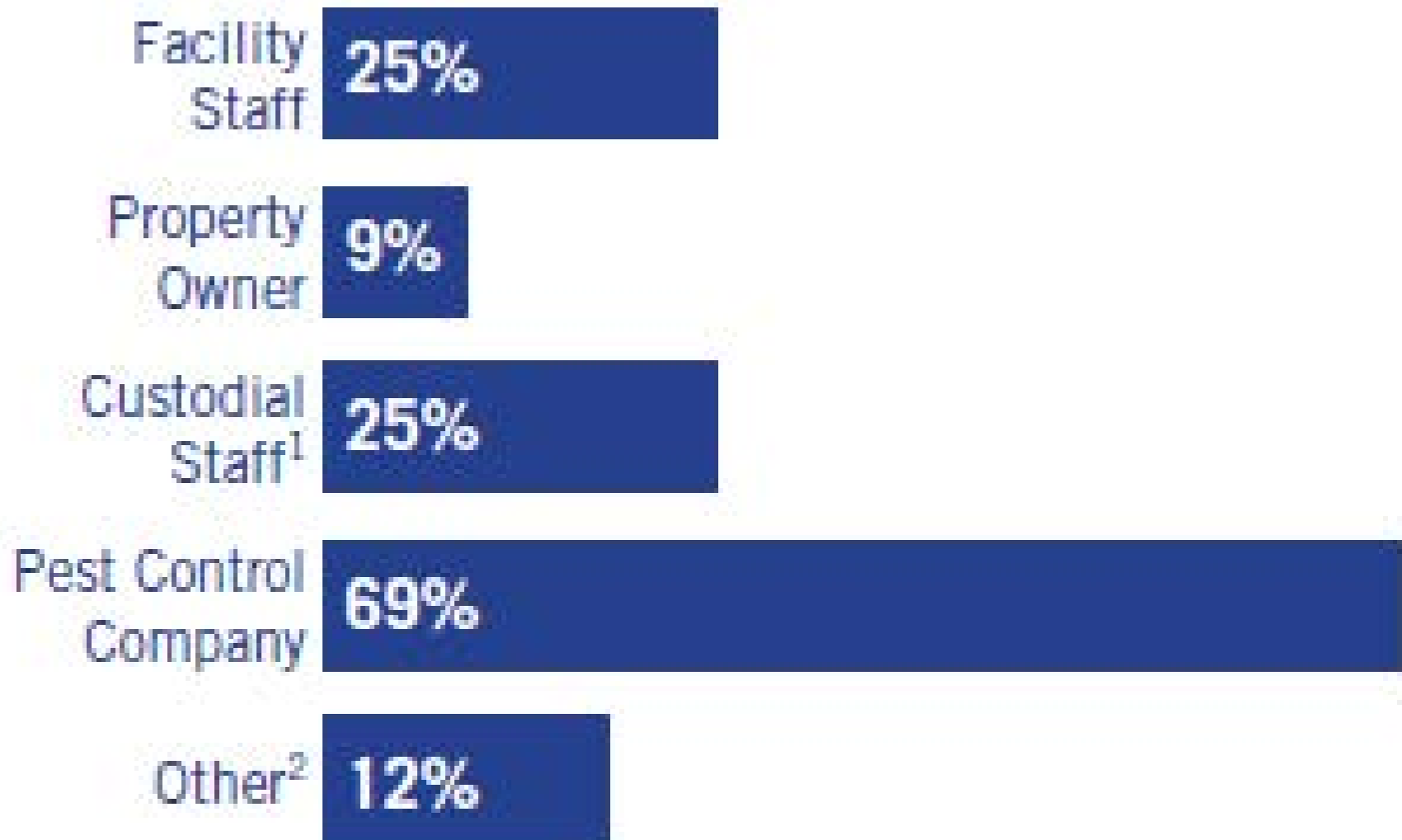


# Pesticide Application Frequency

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Weekly Applications(n=2)	0.3%
Monthly Applications	20%
Occasional	29%

## Figure 3-4. Who Applies Pesticides?



## First National Survey of Environmental Health in Child Care Centers (HUD/EPA) (n=123)

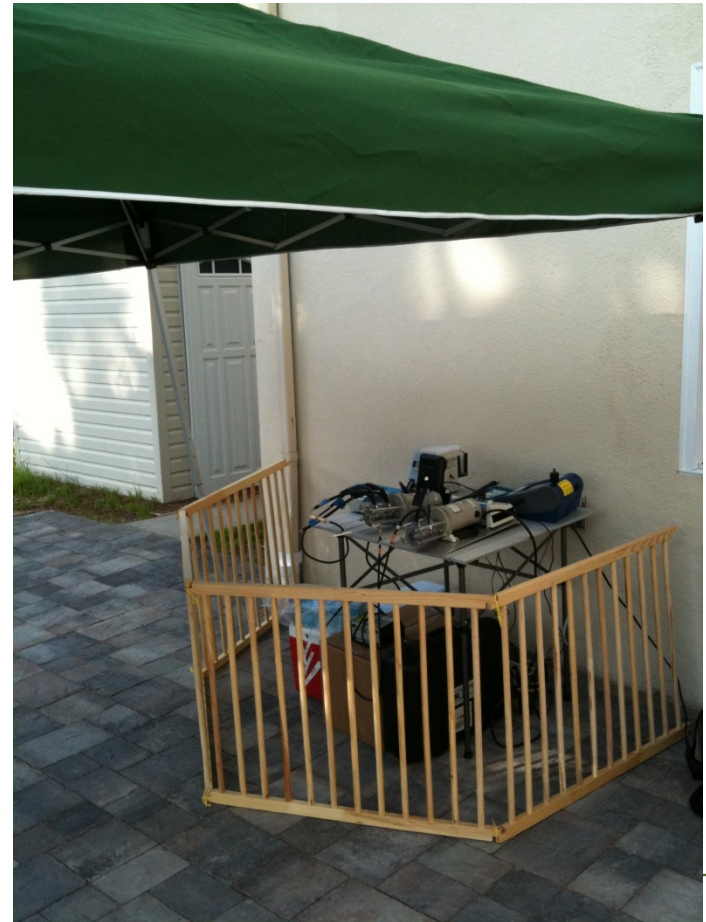
- ❖ 75% used pesticides
- ❖ Up to 10 different pesticides
- ❖ Used as often as 107 times annually (median=12)
- ❖ Very toxic OPs, pyrethroids, and other compounds detected



# Environmental Monitoring in California Child Care Facilities

Air and dust samples collected from 40 childcare facilities. Tested for:

Particles	Phthalates
Pesticides	VOCs
Flame Retardants	Carbonyls
PFCs	



# Research Highlights

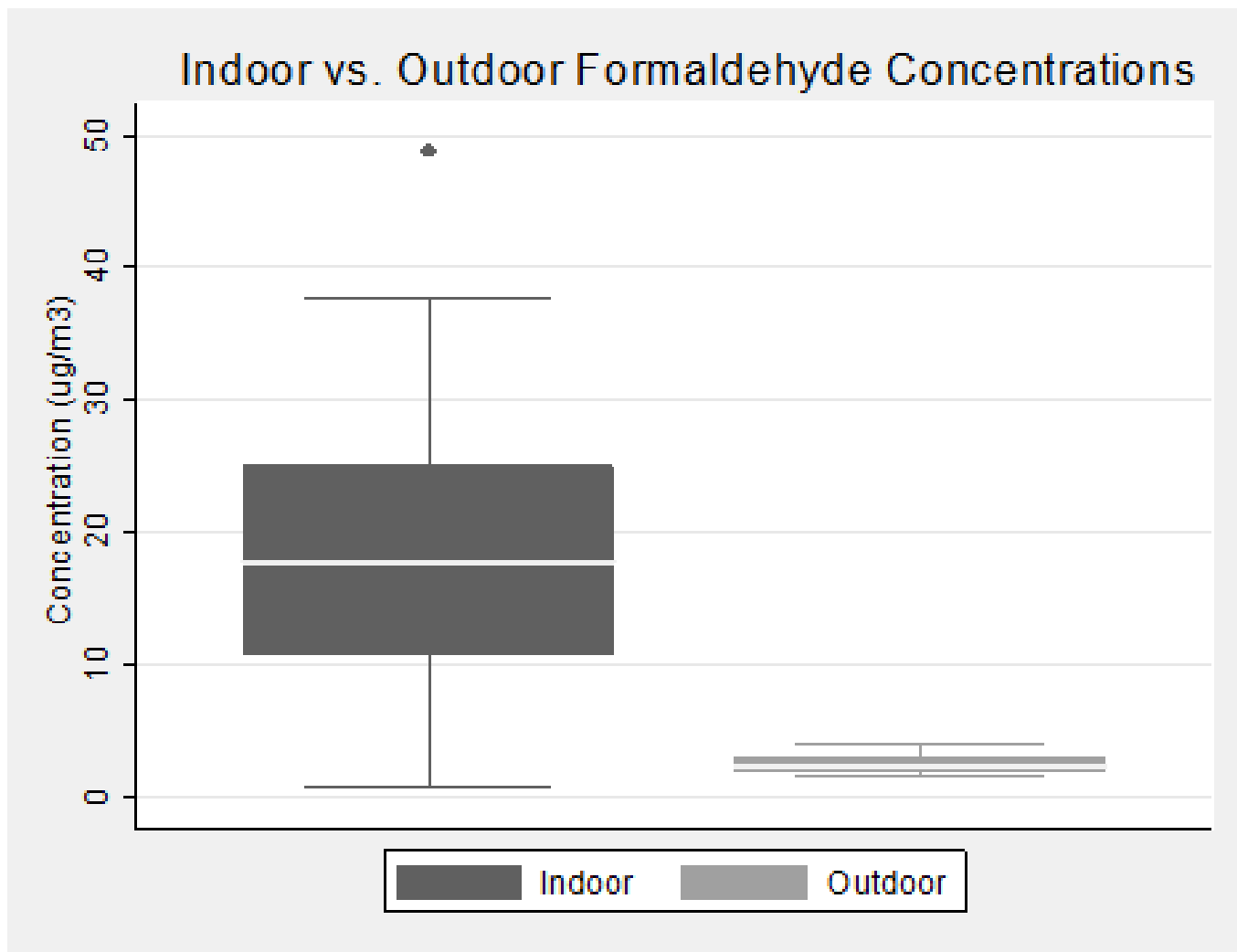


# Volatile Organic Carbons

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- ~70 VOCs quantified
- Trend of higher levels inside.
- VOCs related to cleaning products, building materials, traffic (e.g, benzene, octane).

Preliminary Data.



**Preliminary Data. Do not cite or distribute.**



## **Several VOCs may exceed Prop. 65 guidelines**

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**Based on child-adjusted OEHHA NSRL:**

- Benzene
- Chloroform
- Ethylbenzene
- Acetaldehyde
- Formaldehyde

**Preliminary Data. Do not cite or distribute.**



# VOC Measurement Challenges

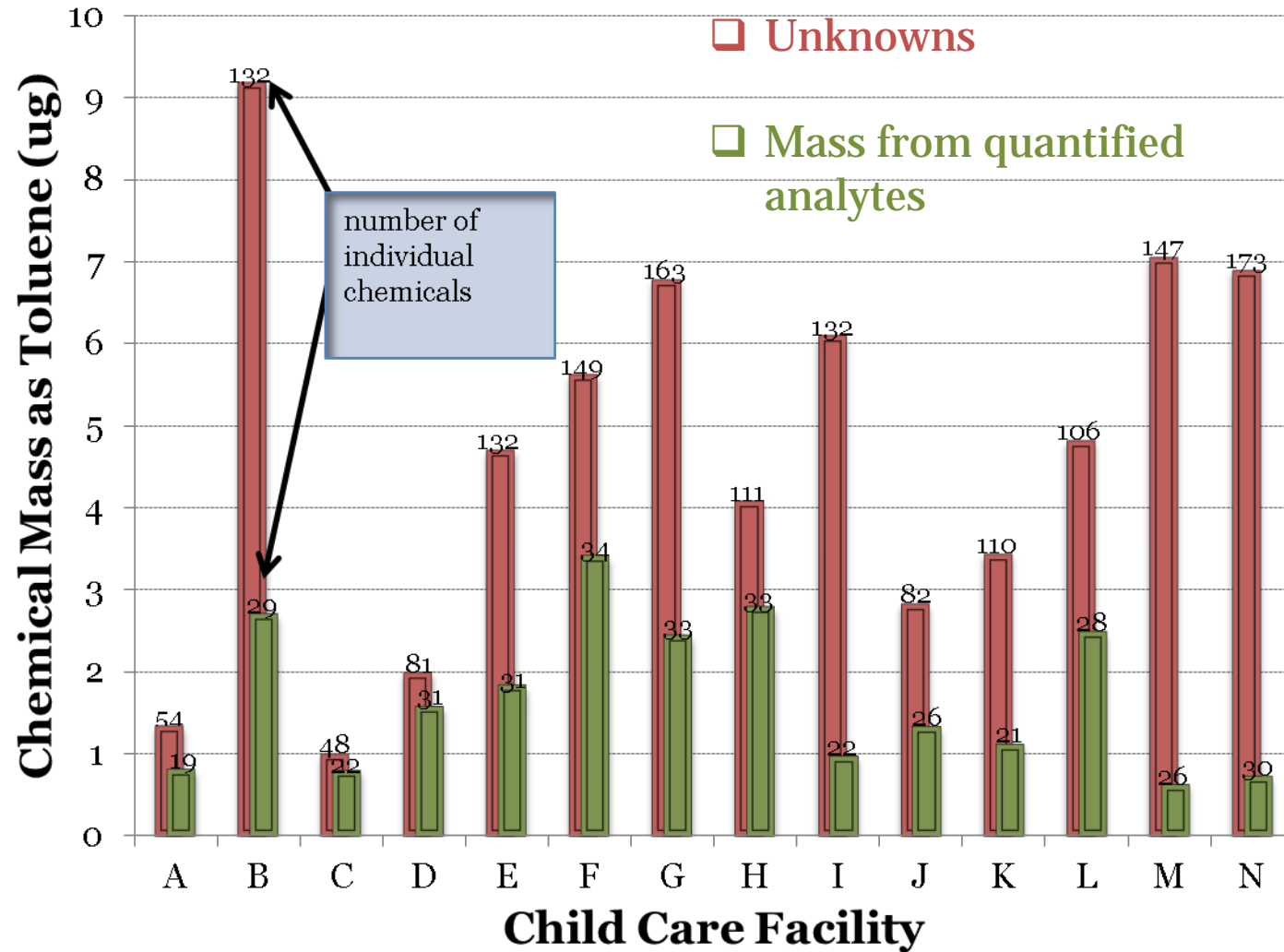
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## Unknowns

- Up to 60% or more of mass;
- Many unknown peaks in chromatograms;

Preliminary Data..

# Identifying Unknown VOCs



Preliminary Data..

# Identifying Unknown VOCs

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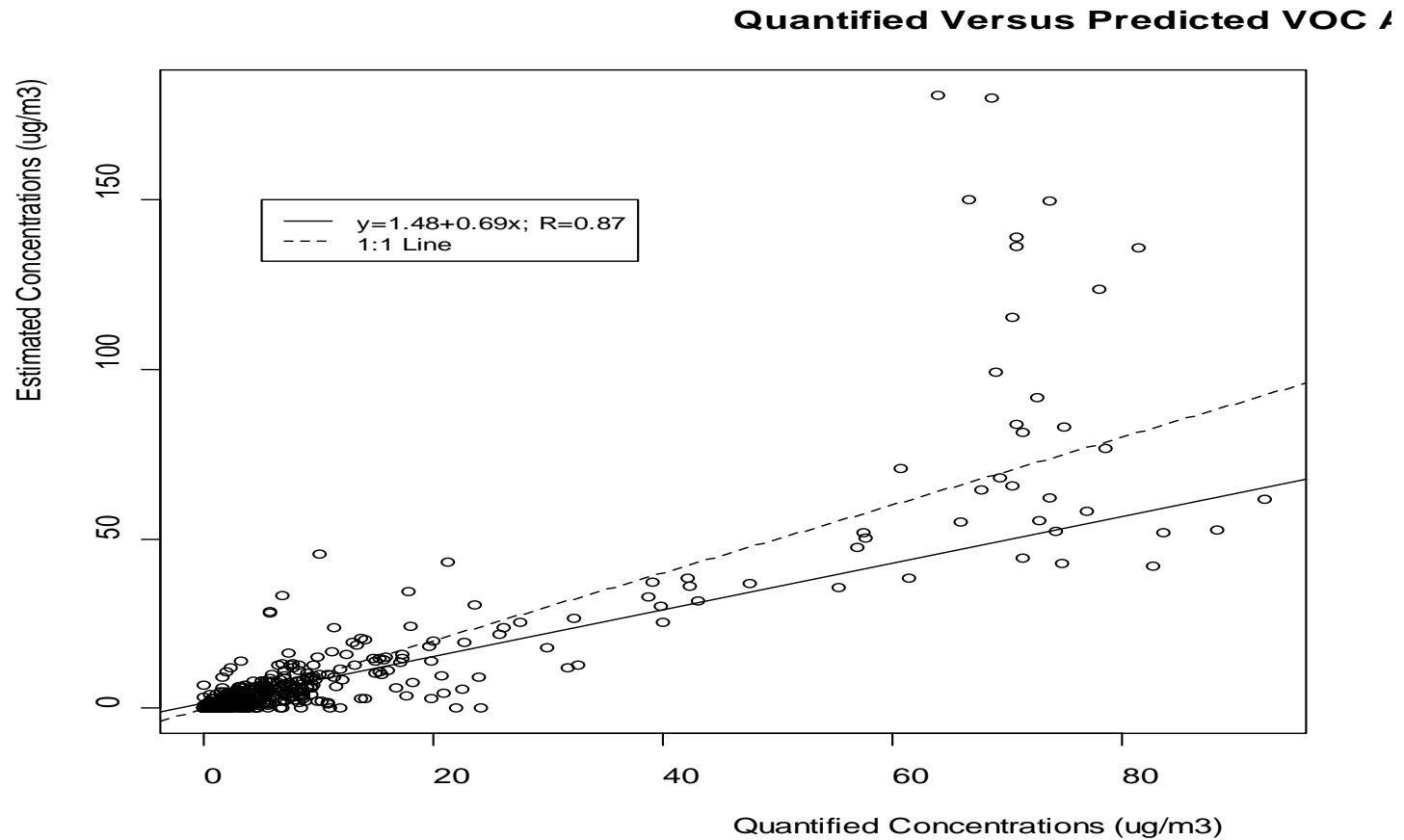
## Quantification Strategy

- Linked to NIST spectral library;
- Accepted if >80% certainty of match;
- Quantified using toluene calibration model;

Preliminary Data..

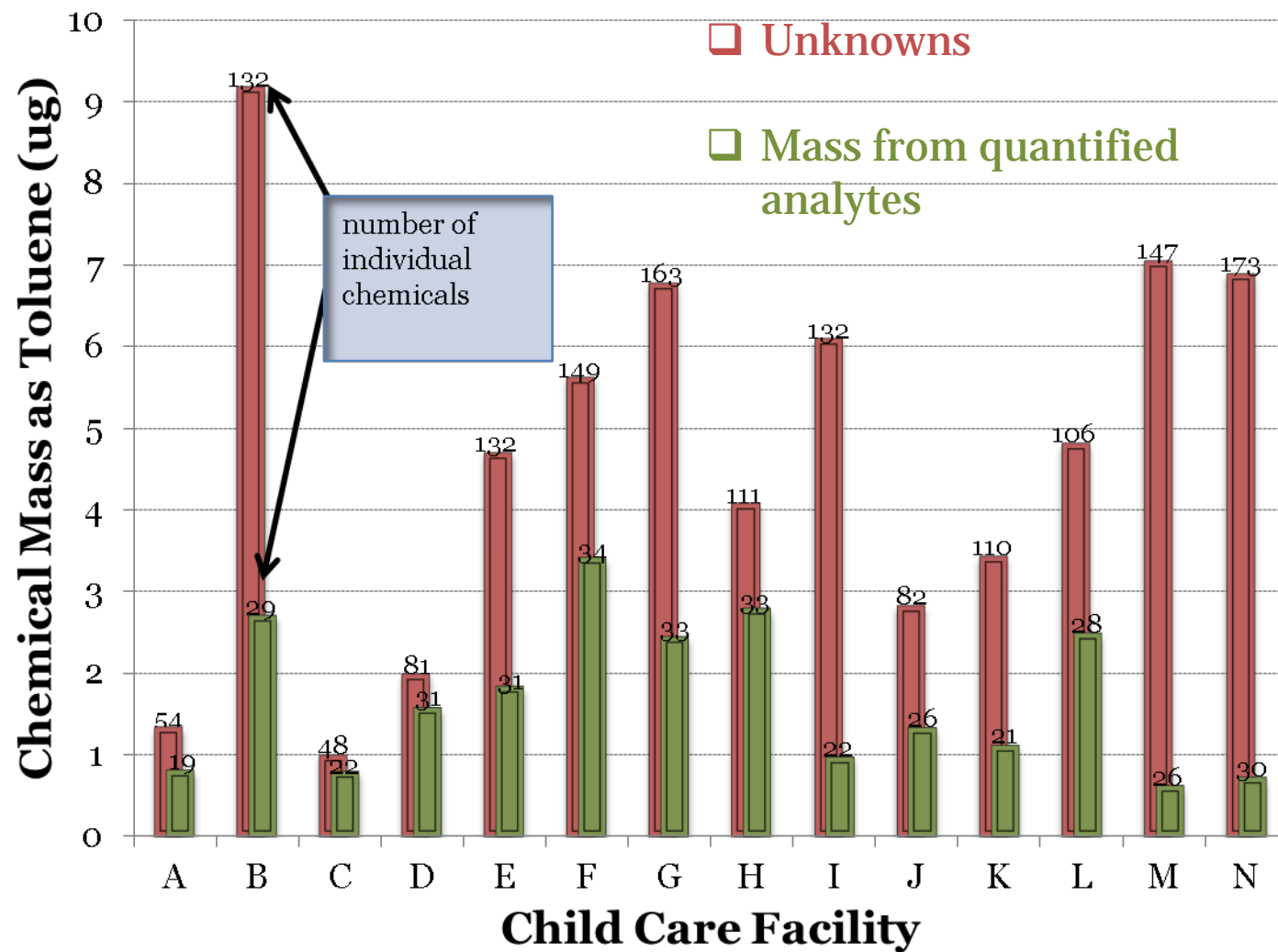


# 130 Additional VOC Chemicals Likely Present



**Preliminary Data..**

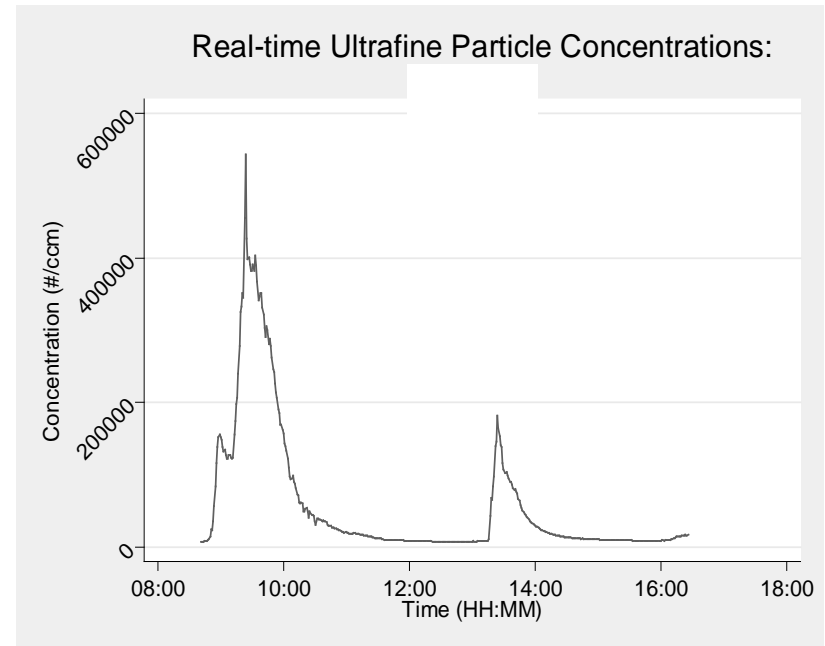
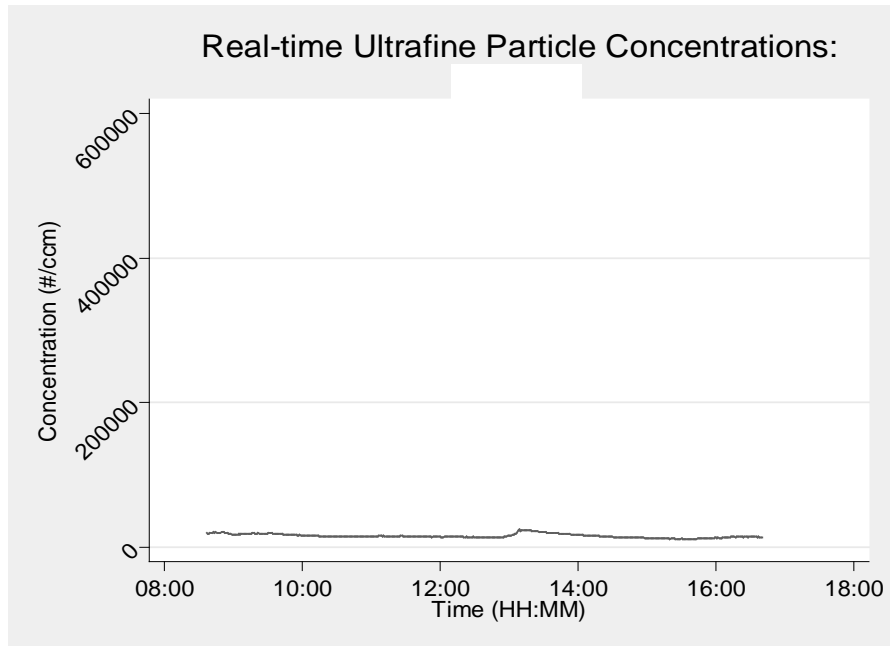
# Rich Area for Future Research



Preliminary Data..

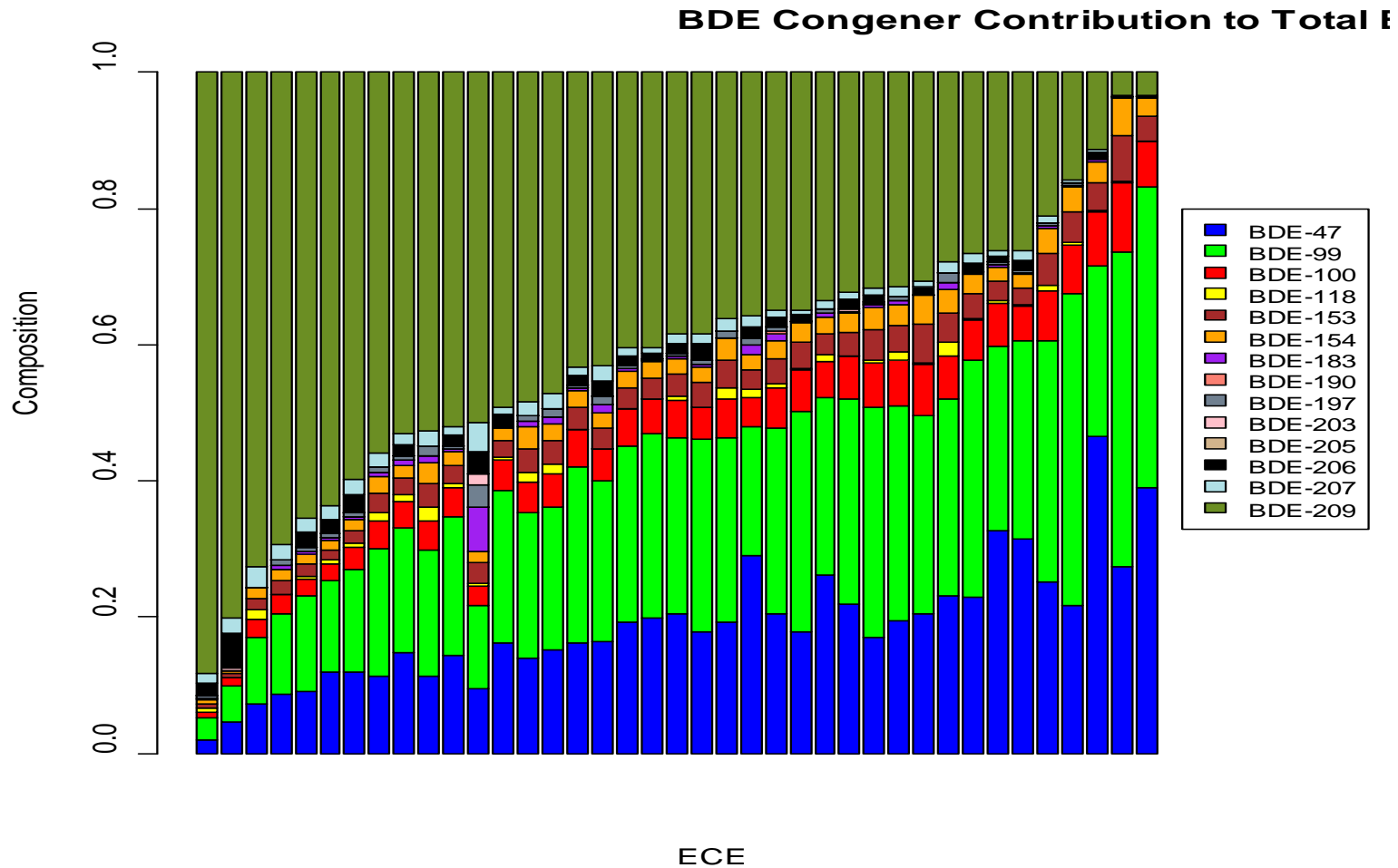
# Other Measurements

Cooking Events Were Determinants of Ultrafine Particle Levels:



**Preliminary Data. Do not cite or distribute.**

# BDE-209 Was Dominant PBDE Congener



Preliminary Data. Do not cite or distribute.

# Summary

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- Child care environments are relatively unstudied;
- Indoor exposures likely overlap with school, residential, and commercial environments;
- Unique factors – e.g., heavier use of disinfectants and cleaners;
- More vulnerable population.

More research needed to quantify exposures, effects on health, strategies to reduce exposures.

# Regional and National Trends





# California

- Healthy Schools Act regulating pesticide use extended to child care centers (2007)
- Department of Pesticide Regulation supporting curriculum development, outreach, and education
- State resources to support research
- County lead poisoning prevention programs targeting child care
- Green certification programs
- Provider agencies supporting outreach and education.
- Children's Environmental Research Centers.

➤ **Growing interest.**

# INTEGRATED PEST MANAGEMENT TOOLKIT FOR EARLY CARE & EDUCATION PROGRAMS



# INTEGRATED PEST MANAGEMENT IN EARLY CARE & EDUCATION PROGRAMS



**UC Berkeley  
Center for  
Environmental  
Research  
and Children's  
Health**

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# OVERVIEW

## A. Healthy Schools Act

## B. Background

- Pests
- Pesticides
- The health risks of pesticides to children & the environment

## C. Integrated Pest Management



# California Policy Directions

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- Extend Healthy Schools Act to cover family day in homes
- Development of community college/state college curriculum
- Outreach to pest management professionals (PMPs)
- Requirement that PMPs servicing child care receive training/IPM certification

# Nationally

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- Several states have or are developing programs to improve child care environments
- EPA web site consolidating access to available resources
- Groups such as the CEHN and National Center for Healthy Homes are developing training resources and networks
- Expect exponential growth in resources over the next 5 years
- Major challenge to reach individual providers



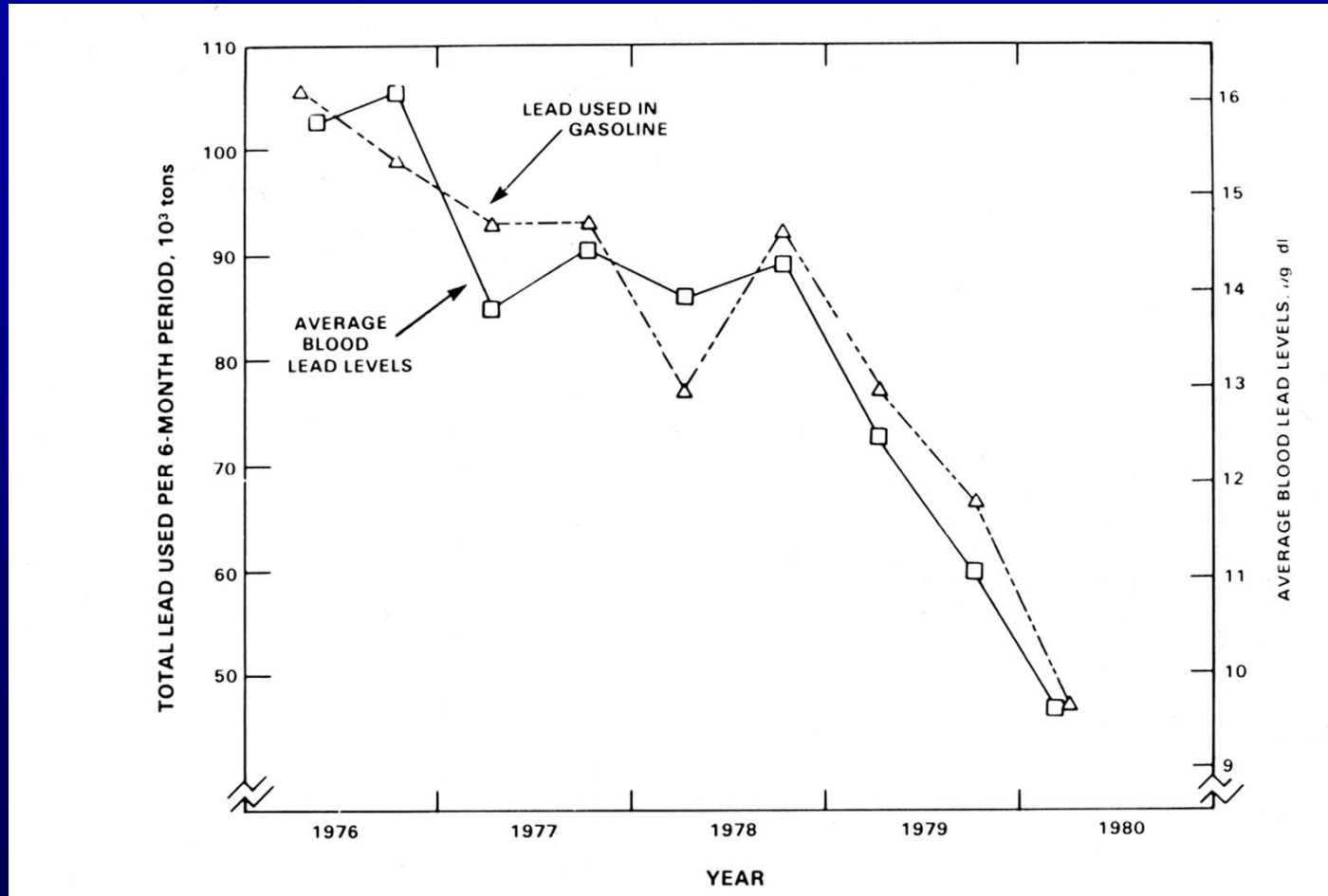
# Environmental Health in Child Care: What each facility should have

- Designated person responsible for environmental health
- Written policies
- Trained employees
- Documentation that policies are followed

# Hopes for the future:

- ❖ Comprehensive resources and training available to ECE providers nationally
- ❖ Recognition of the important role that child care providers can play in improving environments in their community

# Programs to reduce exposures work:



# Acknowledgements

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**Pesticide Regulation**



# Additional Resources

**CERCH**

**<http://cerch.org/research-programs/child-care/>**

**UCSF California Child Care Health Program**

**<http://www.ucsfchildcarehealth.org/index.htm>**

**California Department of Pesticide Regulation**

**<http://apps.cdpr.ca.gov/schoolipm/>**

**Children's Environmental Health Network**

**<http://www.cehn.org/ehcc>**

**Pennsylvania Integrated Pest Management**

**<http://extension.psu.edu/ipm/directory/ljg5>**

**U.S. EPA Child Care Web Site**

**<http://epa.gov/childcare/>**